

CLAIMS

What is claimed is:

- 1 1. A method of reconstructing a session, the method comprising:
2 receiving a plurality of packets over a network interface;
3 analyzing the plurality of packets to identify at least a first flow;
4 identifying an application for the at least a first flow;
5 selecting a corresponding application flow identifier for the application;
6 using the corresponding application flow identifier to identify a plurality of flows in
7 the plurality of packets corresponding to the session.
- 1 2. The method of claim 1 further comprising generating a quality of service report for the
2 session based on the application.
- 1 3. The method of claim 1 wherein the session is associated with an end user experience
2 occurring within a definite time bound.
- 1 4. The method of claim 3 wherein the session is comprised of one or more additional
2 sessions.
- 1 5. The method of claim 1 further comprising filtering the plurality of packets received
2 over the network interface prior to the analyzing, the filtering comprising removing one or
3 more packets from the plurality of packets according to one or more packet capture language
4 rules.

1 6. The method of claim 1 further comprising outputting a plurality of service detail
2 records at predetermined intervals for the application, each service detail record including a
3 billing identifier and a usage information, the usage information derived from the number of
4 packets in the session during the corresponding predetermined interval.

1 7. The method of claim 1 further comprising sending a command to a network device to
2 control the session based on a policy, the policy defining a quality of service for the
3 application.

1 8. The method of claim 1 further comprising sending a command to a network device to
2 control the session based on a policy, the policy defining the amount of resources available to
3 the session.

1 9. The method of claim 1 further comprising sending a command to a network device to
2 stop the session based on a policy, the policy specifying a cost for use of resources and the
3 policy triggering the transmission of the command upon the cost exceeding a predetermined
4 amount.

1 10. A system for reconstructing a session, the system comprising:
2 a packet source, the packet source generating a plurality of packets;
3 a flow manager coupled to the packet source, the flow manager identifying at least one
4 flow in the plurality of packets;
5 an application recognizer coupled to the flow manager, the application recognizer
6 identifying an application corresponding to the at least one flow;

7 a session streamer coupled to the flow manager, the session streamer identifying a
8 plurality of flows in the plurality of packets corresponding to the session based on
9 the application.

1 11. The system of claim 10, wherein each of the plurality of packets includes a plurality of
2 header elements and the at least one flow includes one or more packets with a common packet
3 header element:

1 12. The system of claim 10, wherein the application recognizer can identify at least one of
2 a file transfer protocol (FTP), a hypertext transfer protocol (HTTP), a simple mail transport
3 protocol (SMTP), a domain name service (DNS), a telnet protocol, a post office protocol
4 (POP), an Internet message access protocol (IMAP), a network time protocol (NTP), a
5 Netbios protocol, a network news transport protocol (NNTP), a network time protocol (NTP),
6 a simple network management protocol (SNMP), an Internet Relay Chat (IRC) protocol, a
7 H.323 protocol, a voice over IP protocol, a NetMeeting(TM) protocol, a Quicktime(TM)
8 protocol, a server message block (SMB) protocol, a RealAudio(TM) protocol, a real time
9 streaming protocol (RTSP), and a real-time transport protocol (RTP).

1 13. The system of claim 10, wherein the application recognizer signals to the session
2 streamer to treat the at least one flow as a session when the application recognizer cannot
3 identify an application for the at least one flow:

1 14. The system of claim 10, further comprising a data collector coupled to the session
2 streamer, the data collector for producing service detail records at predetermined intervals for

3 the application corresponding to the session, each service detail record including a billing
4 identifier and a usage information.

1 15. An apparatus for reconstructing a session, the apparatus comprising:
2 means for receiving a plurality of packets;
3 means for identifying at least a first flow in the plurality of packets;
4 means for identifying an application for the at least a first flow;
5 means for selecting a corresponding application flow identifier for the application;
6 means for identifying a plurality of flows in the plurality of packets corresponding to
7 the session using the corresponding application flow identifier.

1 16. The apparatus of claim 15, further comprising means for reporting application
2 appropriate performance characteristics for the session.

1 17. The apparatus of claim 15, further comprising means for controlling a network device
2 according to a policy, the policy defining the amount of resources available to the session.

1 18. The apparatus of claim 15, further comprising means for charging at least one account
2 for resources used during the session.

1 19. A computer data signal embodied in a carrier wave comprising:
2 a computer program for session reconstruction:
3 a first set of instructions for identifying at least one flow in a plurality of packets;
4 a second set of instructions for analyzing the at least one flow to identify an
5 application corresponding to the flow; and

- 6 a third set of instructions for identifying a plurality of flows in the plurality of
- 7 packets corresponding to the session based on the application.

2025 RELEASE UNDER E.O. 14176